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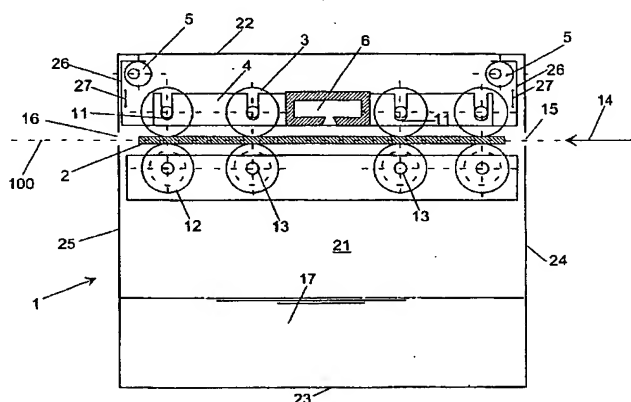
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(54) Title: CONVEYORIZED HORIZONTAL PROCESSING LINE AND METHOD OF WET-PROCESSING A WORKPIECE



(57) Abstract: The problem confronting manufacturers of printed circuit boards (2) of differing thickness is that, as the current density increases and the diameter of the holes decreases, the treatment effect on various locations on the outer side of the boards and inside the holes becomes more irregular. To resolve this problem, a conveyorized horizontal processing line and a method of wet-processing printed circuit boards (2) is described. To manufacture the printed circuit boards (2), data about the thickness of the workpiece (2) are acquired before it enters the conveyorized processing line and are stored in a data memory, the workpiece (2) is conveyed through the conveyorized processing line and a structural component, which is provided with at least one transport member (3) for the workpiece (2) and with at least one processing facility (6) and which is disposed above the conveying path (100) in the conveyorized processing line, is adjusted in such a manner that the structural component is raised or lowered and/or pivoted relative to the conveying path as a function of the thickness of the respective one of the workpieces passing said structural component.

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# INTERNATIONAL SEARCH REPORT

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## A. CLASSIFICATION OF SUBJECT MATTER

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According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 197 17 511 A (ATOTECH DEUTSCHLAND GMBH) 29 October 1998 (1998-10-29) column 1, line 5 - column 3, line 18; claims 1-10; figures 1,2 ---	1-22
A	US 6 261 425 B1 (HUANG PIN CHUN ET AL) 17 July 2001 (2001-07-17) claim 1; figures 1,7-7C ---	1-22
A	EP 0 478 521 A (ILVA SPA) 1 April 1992 (1992-04-01) abstract; claim 1; figure 1 ---	1-22
A	US 6 045 874 A (HIMES RICKY A) 4 April 2000 (2000-04-04) column 5, line 23 - line 32 -----	1-22

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☒ Patent family members are listed in annex.

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Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 19717511	A	29-10-1998	DE 19717511 A1	29-10-1998
US 6261425	B1	17-07-2001	US 6251234 B1	26-06-2001
			US 6241860 B1	05-06-2001
EP 0478521	A	01-04-1992	IT 1242151 B	16-02-1994
			AT 153390 T	15-06-1997
			DE 69126185 D1	26-06-1997
			EP 0478521 A1	01-04-1992
			US 5169505 A	08-12-1992
US 6045874	A	04-04-2000	US 5904773 A	18-05-1999
			US 5614264 A	25-03-1997
			EP 0954385 A1	10-11-1999
			JP 2002512555 T	23-04-2002
			WO 9831475 A1	23-07-1998
			CA 2218883 A1	27-02-1997
			DE 69610763 D1	30-11-2000
			DE 69610763 T2	31-05-2001
			EP 0820351 A1	28-01-1998
			ES 2152033 T3	16-01-2001
			JP 11510734 T	21-09-1999
			WO 9706895 A1	27-02-1997